REMARKS

In the Office Action, the Examiner notes that claims 1-26 are pending in this Application and that claims 1-26 stand rejected. All claims continue unamended by this response.

In view of the following discussion, the Applicant submits that none of the claims now pending in the application are obvious under the provisions of 35 U.S.C. §103. Thus, the Applicant believes that all of these claims are now in allowable form.

REJECTIONS

A. 35 U.S.C. §103

The Examiner has rejected claims 1-26 under 35 U.S.C. § 103(a) as being unpatentable over Kim et al. (U.S. Patent No. 6,711,144, hereinafter " Kim ") in view of Sato (U.S. Patent No. 5,511,068). The rejection is respectfully traversed.

The Examiner alleges that regarding claims 1 and 14, Kim discloses a method of transmitting voice (CBR) and data (VBR) using TDMA. The Examiner further alleges that Kim discloses the step of determining whether the data stream is CBR or VBR by indicating that these two types of traffic are transmitted using different multiple access methods. However, the Examiner concedes that Kim does not disclose the limitation of using a combination of TDMA and CDMA with second spreading factor codewords. As such the Examiner cites Sato for teaching the use of a combination of multiple access techniques in transmitting data. The Applicant respectfully disagrees.

The Applicant respectfully submits that any allowable combination of Kim and Sato fail to teach, suggest or make obvious at least the Applicant's claim 1, which specifically recites:

> "A method of communicating Constant Bit Rate ("CBR") data and Variable Burst Rate ("VBR") data in a single RF carrier via a communication system, said method comprising the steps of:
> determining whether the data stream is CBR or VBR;
> when said data stream is CBR, communicating the CBR data stream using Code Dvision Multiplexing/Code Division Multiple Access ("CDM/CDMA") with first spreading factor codewords, whereby a CBR-CDMA data signal is generated; and
> when said data stream is VBR data, communicating the VBR data stream using Time Division Multiplexing/Time Division Multiple Access ("TDM/TDMA") and CDM/CDMA with second spreading factor codewords." (emphasis added).

The Applicant respectfully submits that Kim and Sato, alone or In any allowable combination, fail to teach, suggest or make obvious the invention of the Applicant at least with respect to claim 1 for "communicating the CBR data stream using Code Dvision Multiplexing/Code Division Multiple Access ("CDM/CDMA") with first spreading factor codewords" and "communicating the VBR data stream using Time Division Multiplexing/Time Divislon Multiple Access ("TDM/TDMA") and CDM/CDMA **with second spreading factor codewords"** as taught In the Applicant's Specification and claimed by at least the Applicant's claim 1. More specifically and as recited above, In support of at least claim 1, the Applicant in the Specification specifically recites:

> "In any embodiment according to this invention, the appropriate CBR spreading factor is determined and fixed. The **VBR spreading factor**, on the other hand, depends on the amount of the VBR traffic: the more VBR traffic, the smaller the factor. At the same time, the smaller the VBR factor, the fewer CBR users that can be supported. Hence, **the VBR spreading factor** is a parameter that determines the trade-off of how much of both types of traffic has to handled. That parameter need not be fixed, e.g., it could be periodically adjusted to the traffic profile. In addition, **the VBR spreading factor** can depend only on the total amount of VBR traffic and on the number of CBR users. The number of VBR users need not enter into the trade-off. The number of VBR users that can share the VBR signal is determined by how that signal is partitioned in time slots, independently of the spreading factors." (See Specification, page 7, lines 9-19). (emphasis added).

The Applicant further recites:

> "More particularly, the spreading factor for the CBR streams is readily determined from the data rate required by the corresponding application. A voice telephony session, for instance, requires a data rate on the order of 10 Kbps, which can be attained with a relatively large spreading factor (64 is commercial vale in IS-95 CDMA). A video session would require a higher data rate and thus a smaller spreading factor, etc. The method of determining the spreading factor for CBR signals is known to those of ordinary skill in the art, for example, as based on the required data rate and the chip rate of the system, which is a parameter that is given by the available bandwidth. From the spreading factors, the transmit power required by every stream can be also calculated easily given some target Signal-to-Interference Ratio (SINR), the interference level, and the location of the corresponding terminal. Since the CBR signals have strict requirements in terms of service, they should be allocated power first. Once they all have their required power, whatever power is left from the available power budget is allocated to the VBR signal. **The spreading factor of the VBR signal is then adjusted**, on a slot-by-slot basis, so that the VBR users can also meet their target SINR given their levels of interference, location, and data rate. Notice that every slot corresponds to a different VBR data stream, thus the need to vary (possibly) the VBR spreading factor. Also, the power requirements of the CBR users will vary over time and that will cascade into a variation in the leftover power for VBR and thus into corresponding spreading.
>
> The architecture of a multiple access (implying many transmitters and a single receiver) implementation of the present invention is shown in Fig. 1. In the multiple access architecture, the transmitters first spread VBR data using CDMA with a **VBR spreading factor**, thereby creating VBR-CDMA data. The transmitters then upconvert the VBR-CDMA data to the appropriate RF carrier frequency and perform the TDMA interleaving by bursting the VBR-CDMA RF data transmissions at individual time slots within the allocated VBR-CDMA bandwidth, thus transmitting VBR-CDMA-TDMA data." (See Specification, page 7, line 20 through page 8, line 18). (emphasis added).

Again, it is evident from at least the portions of the Applicant's specification presented above, that the invention of the Applicant is directed, at least in part, to a method and communication system wherein CBR data stream is communicated using CDM/CDMA with first spreading factor codewords and VBR

data is communicated using TDM/TDMA and CDM/CDMA **with second spreading factor codewords**. In the invention of the Applicant, the first spreading factor for the CBR data is first determined since the CBR signals have strict requirements in terms of service. The second spreading factor codewords for the VBR data is determined at least from what is left of a total power budget after CBR power allocation and from VBR SINR requirements.

As conceded once again by the Examiner in this Final Office Action and agreed upon by the Applicant, there is absolutely no teaching, suggestion or disclosure in Kim for using a combination of **TDMA and CDMA with second spreading factor codewords for communicating VBR data** as taught in the Applicant's Specification and claimed by at least the Applicant's claim 1. More specifically, the Applicant teaches that "In accordance with the present invention, data in a CDM/CDMA system is spread using different spreading codes on a per-data-type basis, e.g., a first spreading code is used for CBR and a second spreading code is used for VBR." (See Specification, Summary). The Applicant in the Specification further recites:

> "Unlike in the prior art, the present invention encodes and multiplexes individual data traffic on a per traffic type basis rather than a per user basis. When users transmit voice, video, and audio data traffic simultaneously, the data traffic is divided into individual data streams and classified based on their data type. Each data stream is transmitted using either CDM/CDMA with a CBR spreading factor, or CDM/CDMA with a VBR spreading factor in combination with TDM/TDMA, based on whether the data stream is Constant Bit Rate Data, or Variable Burst Rate Data, respectively. Thus, a user who transmits voice, video, and audio data traffic simultaneously will experience superior Quality-of-Service, and does not suffer the limitations and inefficiencies of prior hybrid systems, which do not discriminate between Constant Bit Rate Data and Variable Burst Rate Data." (See Specification, page 4, line 21 through page 5, line 4).

From at least the portions of the Applicant's disclosure presented above, it is evident that in the invention of the Applicant, received data traffic is encoded and multiplexed on a per traffic basis rather than on a per user basis as in prior art

systems. More specifically, in the invention of the Applicant, received data traffic is divided into individual data streams and classified based on their data type and each data stream is transmitted using either CDM/CDMA with a CBR spreading factor, or CDM/CDMA with a VBR spreading factor in combination with TDM/TDMA, based on whether the data stream is Constant Bit Rate Data, or Variable Burst Rate Data, respectively. This is also reflected in the Applicant's claim 1 wherein the Applicant recites "A method of communicating Constant Bit Rate ("CBR") data and Variable Burst Rate ("VBR") data in a single RF carrier..." More specifically, in claim 1, the Applicant defines input data traffic from a single user as being divided into individual data streams and classified based on their data type and each data stream is transmitted using either CDM/CDMA with a CBR spreading factor, or CDM/CDMA with a VBR spreading factor in combination with TDM/TDMA, based on whether the data stream is Constant Bit Rate Data, or Variable Burst Rate Data, respectively. In contrast to the Applicant's invention, in prior art systems, data traffic from a first user is spread using a first spreading code regardless of the data type, and data traffic from a second user is spread using a second spreading code.

Furthermore, the Applicant continues to maintain in this response that there is absolutely no suggestion or motivation in either Kim or Sato to combine the teachings of the references to attempt to teach the invention of the Applicant. Merely because the references are classified by the Examiner as being in the same field of endeavor of multiple access techniques for wireless communication systems does not give rise to a suggestion or motivation in either Kim or Sato to combine the teachings of the references to attempt to teach the invention of the Applicant.

That is, for prior art reference to be combined to render obvious a subsequent invention under 35 U.S.C. § 103, there must be something in the prior art as a whole which suggests the desirability, and thus the obviousness, of making the combination. Uniroyal v. Rudkin-Wiley, 5 U.S.P.SQ.2d 1434, 1438 (Fed. Clr. 1988). The teachings of the references can be combined only if there

is some suggestion or incentive in the prior art to do so. In re Fine, 5 U.S.P.SQ.2d 1596, 1599 (Fed. Cir. 1988). **Hindsight is strictly forbidden. It is impermissible to use the claims as a framework to pick and choose among individual references to recreate the claimed invention** Id. at 1600; W.L. Gore Associates, Inc., v. Garlock, Inc., 220 U.S.P.Q. 303, 312 (Fed. Cir. 1983).

Moreover, the mere fact that a prior art structure could be modified to produce the claimed invention would not have made the modification obvious unless the prior art suggested the desirability of the modification. In re Fritch, 23 U.S.P.Q.2d 1780, 1783 (Fed. Cir. 1992); In re Gordon, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984). More specifically, the Applicant submits that the teachings of Kim for a method of transmitting CBR using CDMA and VBR traffic using TDMA comprises no suggestion or motivation for the combination of the teachings of Sato for a mobile communication system capable of transmitting and receiving a radio signal obtained by TDMA and CDMA without interference and vice versa.

The Applicant further submits that even if there was a motivation or suggestion to combine the references in either of the references (which the Applicant believes that there is none), the teachings of the Sato fail to bridge the substantial gap between the Kim reference and the Applicant's invention at least with respect to the Applicant's claims 1 and 14 and actually teach away from the invention of Kim. More specifically, Sato specifically recites:

> "In a communication system from a mobile station to a base station, a transmitter of the mobile station subjects a sequence of transmission signals to both of time division multiple access (TDMA) and code division multiple access (CDMA) to produce a radio output signal located in a time slot of a frame." (See Sato, Abstract).

The above teachings of Sato are in contrast to Kim, which teaches a method of transmitting voice (CBR) using CDMA and data (VBR) using TDMA. An attempt to combine the teachings of Sato with Kim would destroy the functionality of the invention of Kim which teaches a method of transmitting voice (CBR) using

CDMA and data (VBR) using TDMA. More specifically, the combination of Kim and Sato would result in Kim's invention transmitting voice (CBR) and data (VBR) using both CDMA and TDMA. This is in contrast to the original teachings of Kim.

Even further and of great importance, there is absolutely no teaching, suggestion or disclosure in Sato for "when said data stream is CBR, communicating the CBR data stream using Code Dvision Multiplexing/Code Division Multiple Access ("CDM/CDMA") with first spreading factor codewords, whereby a CBR-CDMA data signal is generated; and when said data stream is VBR data, communicating the VBR data stream using Time Division Multiplexing/Time Division Multiple Access ("TDM/TDMA") and CDM/CDMA **with second spreading factor codewords**" as taught in the Applicant's Specification and claimed by at least the Applicant's claim 1. More specifically, Sato fails to bridge the substantial gap between the Kim reference and the Applicant's invention at least with respect to the Applicant's claims 1, at least because Sato fails to teach, suggest or make obvious a combination of **TDMA and CDMA with second spreading factor codewords for communicating VBR data** as taught in the Applicant's Specification and claimed by at least the Applicant's claim 1. That is, the Examiner in this Final Office Action suggested that Sato discloses the step of dispreading the data signal using the second spreading code factor. However, there is no teaching, suggestion or disclosure in Sato for "communicating the VBR data stream using Time Division Multiplexing/Time Division Multiple Access ("TDM/TDMA") and CDM/CDMA with second spreading factor codewords" as taught in the Applicant's Specification and claimed by at least the Applicant's claim 1.

That is, the Applicant teaches and claims that the present invention encodes and multiplexes individual data traffic on a per traffic type basis rather than a per user basis. In the invention of the Applicant, when users transmit voice, video, and audio data traffic simultaneously, the data traffic is divided into individual data streams and classified based on their data type. Each data stream is transmitted using either CDM/CDMA with a CBR spreading factor, or

CDM/CDMA with a VBR spreading factor in combination with TDM/TDMA, based on whether the data stream is Constant Bit Rate Data, or Variable Burst Rate Data, respectively. The Applicant respectfully submits that there is absolutely no teaching, suggestion or disclosure in Kim or Sata, alone or in any allowable combination, for the use of "first spreading factor codewords" and "second spreading factor codewords" as taught in the Applicant's Specification and claimed by at least the Applicant's claim 1 (i.e., on a per traffic type basis rather than a per user basis).

To further clarify, the Applicant respectfully submits that even though the Sato reference was interpreted by the Examiner to teach "second spreading factor codewords", the Kim and Sato references, either alone or in any allowable combination, fail to teach the use of the second spreading factor codewords as taught in the Applicant's Specification and claimed by at least the Applicant's claim 1. More specifically, any teaching of second spreading factor codewords in the references, either alone or in any allowable combination (which the Applicant respectfully submits that no such teaching of second spreading factor codewords exists in either of the references) still fail to teach the use of the first spreading factor codewords and the second spreading factor codewords as taught and claimed by the Applicant and specifically "determining whether the data stream is CBR or VBR; when said data stream is CBR, communicating the CBR data stream using Code Dvision Multiplexing/Code Division Multiple Access ("CDM/CDMA") with first spreading factor codewords, whereby a CBR-CDMA data signal is generated; and when said data stream is VBR data, communicating the VBR data stream using Time Division Multiplexing/Time Division Multiple Access ("TDM/TDMA") and CDM/CDMA with second spreading factor codewords" on a per traffic type basis rather than a per user basis. The teachings of Kim and Sato are silent on how to apply any second spreading factor codewords even if such teachings of second spreading factor codewords did exist as suggested by the Examiner.

For at least the reasons described above, the Applicant respectfully submits that the teachings of Kim and Sato, alone or in any allowable combination, fail to teach, suggest or make obvious, the invention of the Applicant at least with respect to independent claim 1.

Therefore, the Applicant submit that independent claim 1, as it now stands, fully satisfies the requirements of 35 U.S.C. § 103 and is patentable thereunder.

Likewise, independent claim 14 recites similar relevant features as recited in independent claim 1. As such and for at least the reasons disclosed herein, the Applicant respectfully submits that independent claim 14 is also not rendered obvious by the teachings of Kim and Sato, alone or in any allowable combination, and also fully satisfies the requirements of 35 U.S.C. § 103 and is patentable thereunder.

Furthermore, dependent claims 2-13 and 15-26 depend either directly or indirectly from independent claims 1 and 14 and recite additional features therefor. As such and for at least the reasons set forth herein, the Applicant submits that none of these claims are obvious with respect to the teachings of Kim and Sato, alone or in any allowable combination. Therefore the Applicant submits that dependent claims 2-13 and 15-26 also fully satisfy the requirements of 35 U.S.C. § 103 and are patentable thereunder.

The Applicant reserves the right to establish the patentability of each of the claims independently in subsequent prosecution.

CONCLUSION

Thus, the Applicant submits that none of the claims presently in the application are obvious under the provisions of 35 U.S.C. § 103. Consequently, the Applicant believes that all these claims are presently in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

If, however, the Examiner believes that there are any unresolved issues requiring adverse action in any of the claims now pending in the application, it is requested that the Examiner telephone Mr. Jorge Tony Villabon at (732) 530-9404 x1131 or Mr. Eamon J. Wall at (732) 530-9404 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,

E Wall

Eamon J. Wall
Reg. No. 39,414
(732) 530-9404

CUSTOMER #46,363
Moser Patterson & SHERIDAN, LLP
595 Shrewsbury Avenue, Suite 100
Shrewsbury, New Jersey 07702
732-530-9404 - Telephone
732-530-9808 – Facsimile